

PROPOSED
Environmental Assessment
for the



HAVASU NATIONAL WILDLIFE REFUGE
Feral Hog Management Plan

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

ENVIRONMENTAL ASSESSMENT

Feral Hog Management Plan

Havasu National Wildlife Refuge
U.S. Fish and Wildlife Service
Department of the Interior

Authority for Action:
NATIONAL WILDLIFE REFUGE ADMINISTRATION ACT OF 1966
NATIONAL ENVIRONMENTAL POLICY ACT OF 1969
ENDANGERED SPECIES ACT OF 1973
NATIONAL WILDLIFE REFUGE IMPROVEMENT ACT OF 1997

Prepared by: Julie C. Connolly, Biological Technician
Edited by: Aimee Haskew, Wildlife Biologist

October 2002

ENVIRONMENTAL ASSESSMENT

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Havasu National Wildlife Refuge
U.S. Fish and Wildlife Service
Department of the Interior

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1.0 PURPOSE AND NEED FOR ACTION

1.1 Introduction

The feral hogs presently found in the U.S. descend from two sources: those released, abandoned, or escaped, and wild stock (Russian boar) introduced for hunting purposes (Bratton). Although feral hogs look similar to domestic swine, they have several characteristics of wild swine that include: elongation of the skull, a prominent curl in the tail, four continually growing tusks found on both sides of the lower jaw, tough skin composed of cartilage and scar tissue (Bratton). Feral hogs can grow to 3 feet in length and 300-400 pounds in weight.

Feral hogs are the most prolific large mammal in North America. Feral hogs double their population in four months (Barrett and Barrett 1994). Feral hogs breed at six months of age and have an average of two litters per year (USDA). Here at Havasu National Wildlife Refuge (NWR), the feral hogs are observed year round, as sows with their piglets are observed year round.

Feral hogs have demonstrated that they can adapt to just about any habitat type and have established populations in 23 states across the U.S. (Miller 1993, Gipson et. al 1997). seem to prefer moist bottomland and are common along riparian areas with dense vegetation (Stevens 1996). Feral hogs at the Topock Marsh Unit of Havasu NWR are common. Feeding in the emergent vegetation surrounding the marsh and traversing along the network of trails.

Feral hogs are considered to be opportunistic omnivores (Stevens 1996). Feral hogs consume a wide variety of vegetative matter, portions of birds, eggs, small mammals, fawns, piglets, frogs, snakes, lizards, salamanders, turtles, and insects have all been found in feral hog stomachs along with many other types of invertebrates (Wood and Barrett 1979). With their keen sense of smell, feral hogs can locate food sources that are often hidden from view. Feral hogs are also known to be formidable predators. Calves, kids, and even adult deer have been reported as prey items. Feral hogs can become prey of feral hogs (Stevens 1996). Although the feral hog diet is highly variable, diverse diet, the season or time of year determines the main staples of the diet. Refuge include grasses, forbes, roots and tubers. During the late summer / fall months, mesquite beans. The diet of feral hogs has been documented to directly compete with the diets of deer, turkey, waterfowl, squirrels, raccoons, opossums, foxes, bobcats, jackrabbits, cranes, coyotes and chipmunks (Stevens 1996). At Havasu NWR, this list of species was provided to emphasize the diverse diet of feral hogs and the number of species affected by their presence.

Little is known about the introduction of feral hogs on Havasu NWR from domestic stock that belonged to the Soto R from domestic stock flooding of the Colorado River is assumed to be the primary source of swine. Reports of feral swine on the marsh lands go back further than the 1930s.

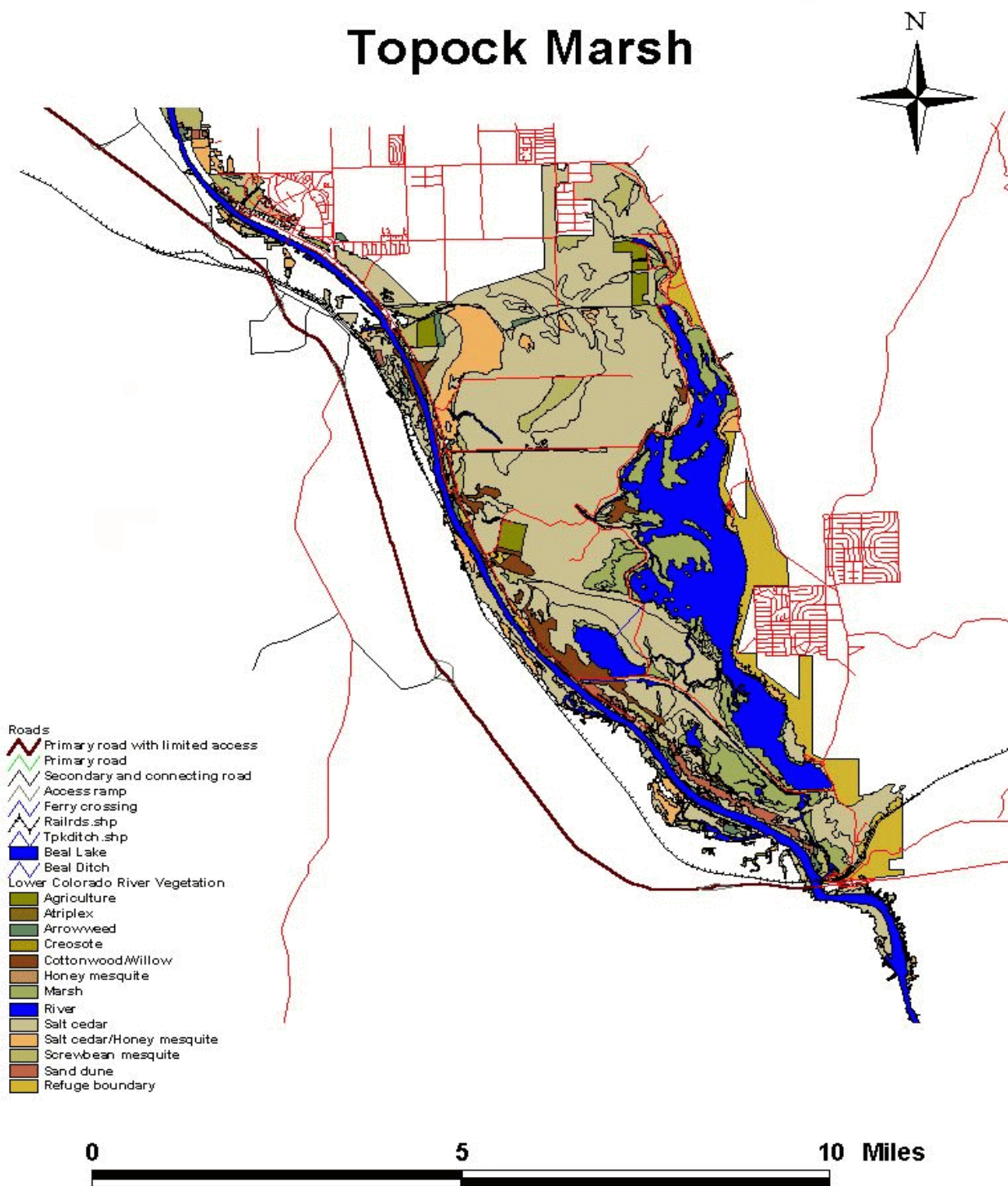


Figure 1. Arc view image of Topock Marsh.

In addition, feral hogs have been inflicting damage to waterfowl
ditches, and levees. Our goal to completely eradicate this exotic pest is necessaditches, and levees
management practices are to be successful.

1.3 *Need*

Rooting, trampling, consumption, accelerated erosion and predation are among the documented
impacts of feral hogs in the US (Sterner and Barrett 1991). Rooting, if impacts of feral hogs in the
potentially alter plant community succedpotentially alter plant commun
native seed crops, consumption of threatened and endnative seed crops, consumption of threatened and e
monocultures or native rangelamonocultures or native rangeland and redumonocultures or nativ
Havasus NWR, the rooting behavior causesHavasus NWR, the rooting behavior causes acceleratedHavasus N
the natural patterns of vegetative succession by promoting the growth of undesthe natural patterns of veg
vegetation such as Salt cedar and Russian Thistle.

Concern about the susceptibility of wetlands to feral hog damage is great, due to the nature oConcern ab
sensitive habitat. During the warm summer months, hogsensitive habitat. During the warm summer
shallow wetlands resulting in erosion that might impact watershallow wetlands resulting in erosion that mi
community (Barrett 1994). At Havasu NWR,community (Barrett 1994). At Havasu NWR, this behavi
endangered Yuma clapper rail. Feral hogs are known to feeendangered Yuma clapper rail. Feral h
rooting activity has the potrooting activity has the potrooting activity has the potential to destroy nests
birds to avoid nest predation. Furthermore, the wallowing behaviorbirds to avoid nest predation. Further
could lead to fouled water supplies, algal blooms, bank erosion, the destructiocould lead to fouled water supplie
and the alteration ofand the alteration of riparian habitat (Stevens 1996). This behavior could potentially effectar
permanent population of endangered Razorback suckerspermanent population of endangered Razorback suckers
at the Beal Lake area of the Refuge.

Feral hogs are notorious for inflicting crop damage andFeral hogs are notorious for inflicting crop damage an
Refuge croplands (USFWSRefuge croplands (USFWS 1975). At Havasu NWR, damage toRefuge cropla
irrigation ditches, and levees has been a problemirrigation ditches, and levees has been a problem for a n
of hog-proof fence was constructedof hog-proof fence was constructed around the 100 acre Topock Farm field
4 miles of fence was constructed along the Pintail slough waterfowl food production area4 miles of fer
(USFWS(USFWS 1979). By 1986 the fences had become dilapidated and hogs were, once again,By 1986 the fenc
seen in these areas.

Feral hogs serve asFeral hogs serve as disease reservoirs (USFWSFeral hogs serve as disease reservoirs (USF
and other animals from the 13 diseand other animals from the 13 diseases they arand other animals from th
brucellosis, pseudo rabies, tuberculosis, bubonicbrucellosis, pseudo rabies, tuberculosis, bubonic plag
two diseases of most concern two diseases of most concern are pseudo rabies and swine brucellosis. Pseudotw
to the rabies viruto the rabies virus and cannot to the rabies virus and cannot infect humans (Stevens 1996).
nervous system. It cannervous system. It can be transmitted and carried by both domestic and feral hogs .
to cattle, horses, goats, sheep, dogs, cats, raccoons, skunks, opossums,to cattle, horses, goats, sheep, dogs, cats,
Once hogs become infected, they are carriers for lifOnce hogs become infected, they are carriers for life.
transmitted through reproductive discharges such as semen or afterbirth (Stevens 1996). Totransmitt

refuge property to trap feral hogs. The Refuge reserves the right to conduct background investigations on any potential trapper (USFWS 2000). All feral hogs captured und become the property of the permittee upon leaving the Refuge. It will be required that all caught are dead prior to leaving refuge property. Trappers will all actions of the permittee will be closely monitored by refuge staff. In addition, all actions of the permittee will be required to submit monthly progress reports that include information on numbers and descriptions of feral hogs. This method is utilized with success in both Merritt Island NWR of feral hogs. Grande Valley NWR Complex (with the exception of a few minor differences).

2.5 *Interagency Agreement with Wildlife Services- Proposed Action*

Under this chosen alternative, the refuge will develop an Interagency Agreement with the Wildlife Services (WS) division to aid in feral hog control. This method would entail contracting a professional through WS that would practice feral hog control on Refuge property year-round. This contracted individual would utilize an integrated pest management approach to feral hog control. This would involve the use of hunting with dogs, trapping, and sweeping. In addition, the contracted agent will be required to submit monthly progress reports that include information on numbers and descriptions of feral hogs. The assigned agent will follow the procedures and restrictions stipulated in the FHMP, and by the refuge. All shot on site and left in the brush for scavengers, although means to utilize meat resulting from control efforts would be investigated.

3.0 **AFFECTED ENVIRONMENT**

3.1 *Physical Environment*

3.1.1 General

Havasupai National Wildlife Refuge (NWR) encompasses 37,515 acres adjacent to the Colorado River, Topock Marsh, Topock Gorge, and the Havasu Wildlife Refuge (Figure 2). The habitat varies from thick cattail/bullrush stands and vegetation found along the Colorado River and Topock Marsh, to steep cacti vegetation found along mountains found along Topock Gorge and Havasu Wilderness (mountains found along Topock established by Executive Order in 1941 to protect and manage established when Parker Dam was closed.

The following is excerpted from the *Preliminary Hydrologic Investigation* (-Brad Guay Ph.D. Candidate 1998):

The climate is semiarid to arid, with a 50 year (Needles airport) average annual temperature between 115-125 degrees Fahrenheit (1997). Located on the Pacific Flyway, and flanked by the Colorado River as a carrier deck for passing birds. With respect to

(LCRB), (LCRB), or more specifically, between upper lake Mead and (LCRB), or more specifically, between waterwater is estimated by water is estimated by water is estimated by the USBR (1996) as follows: (1) river- 18,700, and (3) backwater- 10,200 ac. Of these backwater river- 18,700, and (3) backwater- 10,200 of the best habitat and foraging areas for waterfowl, Topock of the best habitat and foraging areas for waterfowl or roughly 40 percent.

The marsh receives Colorado River water through two east-flowing diversion canals not lost to evaporation or seepage is released to the river where it eventually reenters the river. Within the marsh emergent vegetation (sparse and dense areas) and areas.

The target area for this Feral Hog Management Plan encompasses the 15,000-acre Unit (Figure 1). This unit is bounded by Interstate 40 to the south, the Navajo Reservation to the North, and the Colorado River to the West. If successful around the marsh, they will be extended down the river corridor through the Tsu Gorge unit.

3.1.2 Soils

The soils of Havasu NWR are located in the The soils of Havasu NWR are They are predominantly sandy in nature with the exception of T and lake edges. Most of the soils have restricted drainage, and lake edges. Most of the soil than 60 inches below the surface. In this area the water go down in October. The water table is at its highest from April to October.

3.1.3 Land status

The following information is excerpted from the *Lower Colorado River National Wildlife Refuges Comprehensive Management Plan (1994)*:

The Service's jurisdictional rights on the lower Colorado River NWR, are proprietary. The majority of lands comprising NWR, are proprietary. The majority of lands were conveyed to the Service by Public Land Order after these lands had either been withdrawn from Public Domain or had been obtained by the United States Government through condemnation proceedings. The lower Colorado River encompassing Havasu NWR, were established and management of the lower Colorado River and private owners either voluntarily or by condemnation proceeding conveyance was through several Public Land Orders published Unit United States Fish and Wildlife Service (the Service) owns most of the land within the defined boundaries of Havasu NWR, as defined boundaries of Havasu Refuge on Bureau of Reclamation (BR)-acquired lands (for Refuge on Bureau of Reclamation (BR)-acquired lands). The Refuge adjoins acreage belonging to the Fort Mojave Indian Tribe, the Chemehuevi Indian Tribe.

Infrastructure on the Refuge includes several observation towers. One concession exists at Five Mile to the Topock Marsh Unit. The concession operates under to the Topock Marsh Unit. The concession is privately operated and provides temporary trailer space, docks, and grocery items. The lease terminates on July 31, 2006.

3.2 *Biological Environment*

3.2.1 Fauna

Havasus National Wildlife Refuge was established by *Executive Order 8647* on January 22, 1941, as a Refuge and breeding ground for migratory birds, 42 species of mammals and 38 species of reptiles and amphibians. Havasu NWR (USFWS 1994).

Federally listed endangered species associated with Havasu NWR include two birds, the Yuma clapper rail and the Southwestern willow flycatcher, two fish, the Razorback sucker and the Bonytail, and the California condor. The Refuge is also within the range of the lowland candidate species.

Havasus NWR also supports a variety of species that are State-Listed. Havasu NWR also supports several species listed as threatened in California and as a species of special concern. The Snowy egret is listed as endangered in California. Arizona lists the Snowy egret as a species of Special Concern. The Yellow-billed egret is listed as a species of Special Concern. The California and threatened in Arizona (USFWS 1994).

3.2.2 Flora

Havasus NWR is located in the southern portion of the Mojave Desert. In the spring, depending on rainfall patterns, color in the form of wild flowers and other herbaceous plants. Marsh provide relief from the creosote flats and smoke tree/palo verde with the area. Goodding's willow and Fremont's Screwbean and Honey mesquite. Havasu NWR is dedicated to the removal of exotic, invasive species, such as salt cedar (*Tamarix sp.*), and restoration of native vegetation, such as willow, cottonwood.

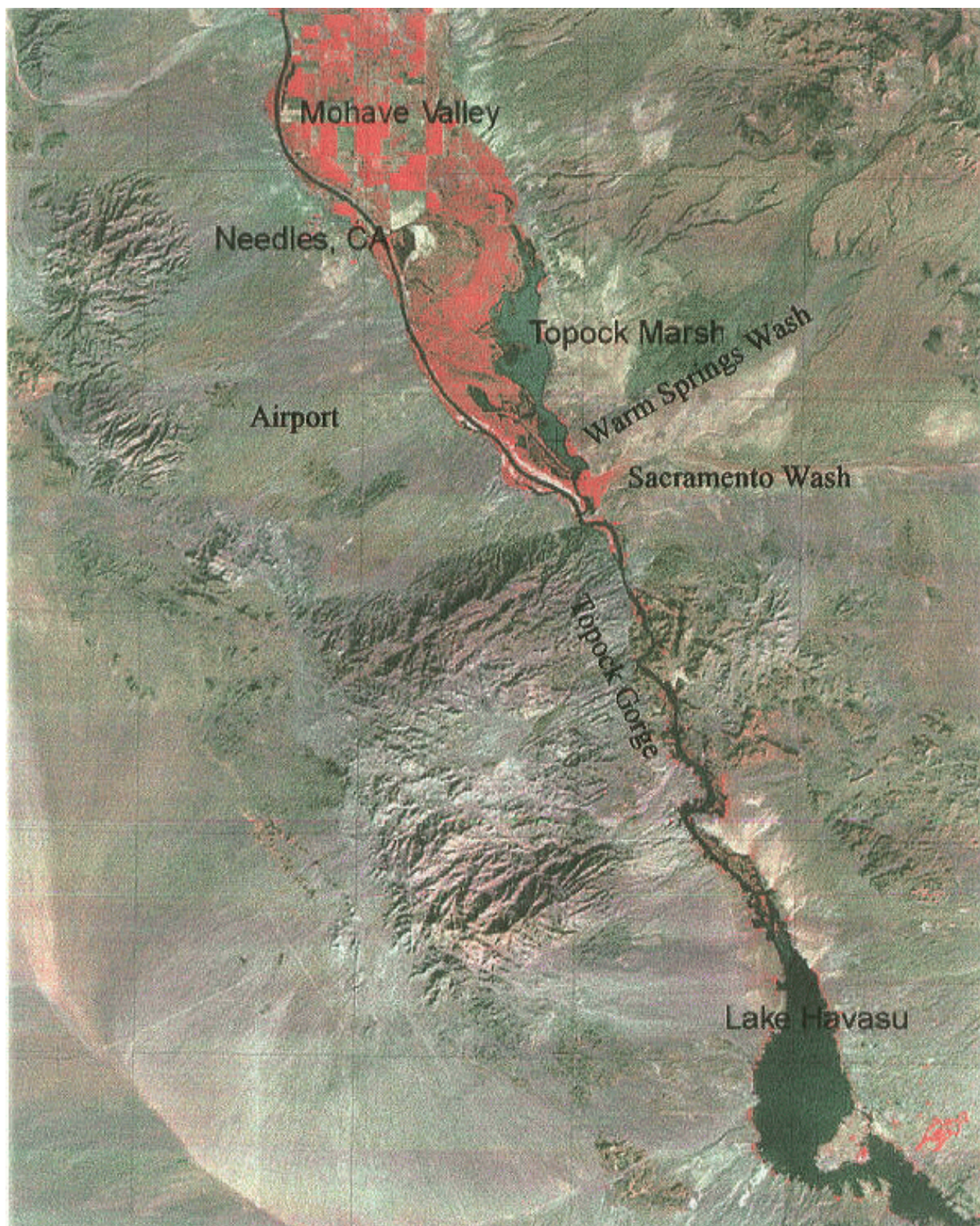


Figure 2. 1981 Landsat image of Needles Area.

3.3 *Cultural and Human Environment*

3.3.1 Archaeological/Historical Features

TheThe archaeological sites recorded to date on theThe archaeological sites recorded to date on the Refuge typify the River.River. Rock art sites called petroglyphs, ground imagesRiver. Rock art sites called petroglyphs, ground images, clearings,clearings, dance patterns, cairns, trails, sparse scattersclearings, dance patterns, cairns, trails, sparse scatterings, primaryprimary archaeologicalprimary archaeological occurrence onthe Refuge (USFWS 1994). These images give intointo theinto the complex societiesinto the complex societies of the Mojave people, who once occupied the land ColoradoColorado RiverColorado River atColorado River at the time of Spanish entry. Currently, evidence of their non-existent.non-existent. Annual flooding and movements of thenon-existent. Annual flooding and movements of their long-term habitation (USFWS 1994).

3.3.2 Public Use

SinceSince it sSince it s establishment in 1941, Havasu NWR has beenSince it s establishment in 1941, Havasu NWR. EachEach yearEach year thousands of people launch their boats to explore the beauty found at theEach year thousands of people launch their boats to explore the beauty found at the unitunit of Havasu NWR. Topock Marsh is a favoriunit of Havasu NWR. Topock Marsh is a favorite unit of quail hunting, kayaking, and canoeing.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 *No Action*

ThisThis alternative would be detrimental to theThis alternative would be detrimental to the Refuge sThis alternative would be detrimental to the native native wildlife resources. The feral hogs would continue to inflict damage to watemative wildlife resources. The feral hogs would continue to inflict damage to water productionproduction areas, irrigation ditchesproduction areas, irrigation ditches and levees, revegetation sites, and programs.programs. In addition, this alternative wouldresult in continued quality,quality, altered plant community successional sequences, asquality, altered plant community successional sequences, as the method would not meet our need to remove feral hogs from Refuge lands.

4.2 *Physical or Mechanical Barriers*

AsAs previously stated, this control method is generally considered toAs previously stated, this control method is generally considered to be effectiveeffective control method because feral hogs can find their way through just about any typeeffective control method because feral hogs can find their way through just about any type of fence (Stevens(Stevens 1996). In addition, hog proof fencing(Stevens 1996). In addition, hog proof fencing is difficult to install (Stevens 1996).). Furthermore,). Furthermore, because of the widespread damage caused by feral hogs, the areas are too large to effectively protect solely with physical or mechanical barriers (USFWS 2000).

SignificantSignificant negative impacts on the native ecosystem could resSignificant negative impacts on the native ecosystem could result from the alternative.alternative. Severe damage tovegetation would result from the clearing and fencefence installation. The removal ofvegetation would impact soil qualityand increase erosion in some areas,areas, as well as accelerate the spread of undesirable, invasive vegetareas, as well as accelerate the spread of undesirable, invasive vegetation.

4.6 Alternatives Table

ALTERNATIVES TABLE

IMPACT TOPICS	NO ACTION	PHYSICAL OR MECHANICAL BARRIERS	PUBLIC HUNTING	CONTRACT REMOVAL EXPERTS	INTERAGENCY AGREEMENT
Habitat Improvement	Zero habitat improvement would result from this method.	Habitat improvement would increase as hog numbers decline. Dependant on how well fences are maintained.	Habitat improvement would increase as hog numbers decline. Number of hogs removed depends on success and length of hunt.	Habitat improvement would increase as hog numbers decline.	Most effective control method in terms of the largest number of feral hogs to be taken in the shortest amount of time.
Risks to Environment	Continued damage to endangered species recovery programs, revegetation sites, irrigation ditches and levees. Continued soil erosion and degradation of water quality.	Severe damage to vegetation. Possible restrictions to wildlife movement resulting in fragmented populations of wildlife. Trampling of habitat from fence installation.	Impacts from vegetative trampling, and trail construction, disturbance to research areas, an increased risk of fire.	Contractors might display less sensitivity to the impacts of their operation on the vegetation and wildlife.	Disturbance to vegetation might result from the construction and placement of feral hog traps. Noise from aerial hunts would temporarily impact wildlife populations. Non-target species would be at risk of entanglement in snares.
Cultural Resources	Zero impacts to public access and recreational opportunities.	Zero impacts to public access, recreational opportunities, and archaeological sites.	Increased recreational activities for hunting. Restricted public access for non-hunting visitors during hunt season.	Possible reduction of some public use. Benefits to local hunting enthusiasts who qualify for special permit.	Conflicts with local hunting enthusiasts. Zero public use during aerial hunts.
Social or Economic Issues	No change to social or economic issues.	Benefit to local economy from generating business for local suppliers of materials and contracting services for fence construction.	Benefits to local commerce from sporting goods purchases. Increased sense of community cohesion from public involvement.	Benefits to the local economy from the purchase of materials, ammunition and equipment would result.	Benefits to the local economy from the purchase of materials, ammunition and equipment would result.
Management Control	Limited-Refuge effort minimal. Full staff effort not required.	Intensive control from Refuge for feral hog management.	Limited management Refuge has indirect control of resource.	Indirect control by refuge personnel of feral hog management. Intensive hog reduction expected.	Refuge personnel in indirect control of feral hog management approach. Intensive hog reduction expected.
Expense	Method accomplished at current funding level.	Considered to be the most expensive and least effective control method for feral hogs.	Staff costs low. Cost of administration. Public access, supervision and maintenance high.	Substantial revenue for Refuge. Cost of staff supervision, organization and administration high.	Relatively expensive - might require a significant increase in the Refuge budget. Minimal Refuge supervision.

5.0 POLICIES AND REGULATIONS GOVERNING FERAL SWINE CONTROL

The following is excerpted from the Lower Rio Grande NWR Complex EA and applies directly to the contents of this draft EA:

The policy of the U.S. Fish and Wildlife Service (Service) is to engage in the control of wildlife within the National Wildlife Refuge System to assure balanced wildlife and fish populations consistent with the optimum management of Refuge habitat. All control methods will be accomplished by the most humane manner and in accordance with Service directives.

Incidental control and selective trapping of feral animals are authorized under the Refuge Manual, 7 RM 14.7E. In addition, animals without ownership that have reverted to the wild from a domestic state (i.e. feral hogs) may be taken by authorized Federal or State law or regulations as outlined by title 50 CFR (Code of Federal Regulations), Part 30, Section 11. Authorization of control practices are further governed by title 50 CFR, Part 31, Section 14: (a) Animal species which are surplus or detrimental to the management program(s) of a wildlife Refuge area may be taken in accordance with Federal and State laws and regulations by Federal or State personnel or by permit issued to private individuals; (b) Animal species which are damaging or destroying Federal property within a wildlife Refuge area may be taken or destroyed by Federal personnel. Disposition of feral hogs is covered under title 50 CFR, Part 30, Section 12: Feral animals taken on wildlife refuges may be disposed of by sale on the open market, gift or loan to public or private institutions for specific purposes, and as otherwise provided in section 401 of the act to June 15, 1935 (49 Stat. 383, 16 U.S.C. 715s). The authority to allow harvest of feral hogs on Refuge lands is governed under the provisions of the regulations for hunting on wildlife refuges title 50 CFR, Part 32.

6.0 CONSULTATION AND COORDINATION WITH OTHERS

Several contacts were made to solicit comments, views and ideas during the development of the Feral Hog Management Plan and Draft Environmental Assessment. Reginald Barrett, a leading authority of feral hogs from University of California Berkeley, provided much needed information and literature on feral hog biology and management. Hakalau Forest NWR in Hawaii, Merritt Island NWR in Titusville, Florida, Lower Rio Grande Valley Complex in Alamo, Texas provided management plans and Environmental Assessments for review from their respective stations to help address and draft feral hog control measures. Dave Jones of the Natural Resources Division, HQ 1ST INF DIV and Fort Riley provided information about development and the success he witnessed associated with the Interagency Agreement his agency developed with Wildlife Services. Kathy Granillo, Regional Office Biologist (R2) provided information on contacts and guidance. Jack Crabtree of San Bernard NWR, Brian Woodward of Ace Basin NWR, Dennis Sharp of Lake Ophelia NWR, Kelly Hayes of Aransas NWR, and Craig Heath of AZGF, all provided valuable information regarding feral hog control techniques.

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Appendix A. INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM
CONSULTATION/CONFERENCE/CONCURRENCE

Originator: Julie C. Connolly, Wildlife Biological Technician

Date: August 23, 2001

I. Region: Region 2

II. Service Activity (Program): Havasu National Wildlife Refuge
PO Box 3009
Needles, CA 92363

III. Pertinent Species and Habitat:

A. Listed species and/or critical habitat within the action area:

Southwestern willow flycatcher (Empidonax trailii)

Bonytail chub (Gila elegans) (critical habitat)

Yuma clapper rail (Rallus longirostris yumanensis)

Razorback Sucker (Xyrauchen texanus)

B. Proposed species and/or proposed critical habitat within the action area:

None

C. Candidate Category 1 species within the action area:

None

D. Candidate Category 2 species within the action area:

None

IV. Geographic Area or Station Name and Action:

TheThe proposed action is toThe proposed action is to conduct a long termThe proposed action is to conduct
andand possibly along the Colorado River through the Topock Gorge Unit of Havasu National
WildlifeWildlife Refuge. Wildlife Refuge. The plan would entail development of an Interagency Agreement
WildlifeWildlife Services (WS) division of the US DepartmentWildlife Services (WS) division of
contractedcontracted agentcontracted agent would conduct hog eradication practices for a period of three years
an Integrated Wildlife Damage Managementan Integrated Wildlife Damage Management (IWDM) approach
methodology would involvemethodology would involve the usemethodology would involve the use of carcass
hunts,hunts, neck and leg snares, and aerial shooting in coordinationhunts, neck and leg snares, and aerial
are in coordination with.

V. Location (map attached):

A. County and State:

Mohave, AZ

B. Distance (miles) and direction to nearest town:

The Fort Mohave Indian Reservation (FMIR) borders n areas with expected feral hog control activity. A Memorandum of Understanding (MOU) will have to be developed as h Bureau of Land Management (BLM) land.

VI. Description of proposed action:

See attached draft Environmental Assessment

VII. Explanation of effects of action on species and critical habitat C, and D.

No permanent adverse effects to critical habitat or special the proposed project vicinity are ex includes stipulations and restrictions for anyone conducting feral hog control must include stipulations. They are as follows:

1.1. No feral hog control in the Southwestern willow flycatcher (WIFL) habitat. No feral hog control breeding season April 15-September 1.

2. No trail or vegetation cutting in WIFL habitat.

The main area of the project site does not provide adequate Bald eagles and none are present within the action area (Havas NWR unpublished survey information). The periodic aerial hunting of feral hogs, corridor in late fall/early winter (before Peregrine falcons arrive from breeding season) will avoid any adverse impacts to nesting Peregrine falcons.

Although the area is within designat bonytails present in the area. Bonytail chubs and Razorback suckers were c toto be introduced to Beal Lake after completion of the improvement project. Due to a series of delays and project pro been postponed indefinitely. If anything, the Plan would benefit their critical habitat by reducing the number that area.

VIII. Effect determination and response requested:

A. Listed species/critical habitat:

Determination

R e s p o n s Response
Requested

No effect

_____ *Concurrence

Is not likely to adversely affect (Southwestern
willow flycatcher, peregrine falcon, bald eagle, Yuma
clapper rail, razorback sucker, or critical habitat of bonytail chub)

_____ Concurrence

Is likely to adversely affect

_____ *Formal
Consultation

Undetermined effect

_____ Informal
Consultation

B. Proposed species/critical habitat:

Determination

R e s p o n s Response
Requested

No effect

_____ *Concurrence

Is not likely to adversely affect

_____ Concurrence

Is likely to adversely affect

_____ *Formal
Consultation

Undetermined effect

_____ Informal
Consultation

C. Category 1 Candidate species:

Determination

R e s p o n s Response
Requested

No effect

_____ *Concurrence

Is not likely to adversely affect

_____ Concurrence

Is likely to adversely affect

_____ *Formal
Consultation

Undetermined effect

_____ Informal

D. Remarks:

The proposed action is notThe proposed action is not likely toThe proposed action is not likely to adversely
the action will be minimal.

IX. Reviewing Office of evaluation:

A. Concur _____ **Nonconcurrence**

B. Formal consultation required _____

C. Conference required _____

D. Remarks (additional pages attached as needed):

Signature

Date

* Optional

Appendix B. NEED FOR MEMORANDUM OF UNDERSTANDING

Feral hogs are not just isolated on Refu
Refuge. If the goal of total eradication of feral hogs is to be met, Refuge. If the goal of total eradica
lands that populations are established in order to prevent plands that populations are established in or
Memorandum of Understanding (MOU) with those bordering lands (Bureau o
Mohave Indian Reservation) is necessary to ensure success of this project.